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(54) Title: METHOD FOR EVALUATION OF POLYMORPHIC GENETIC SEQUENCES, AND THE USE THEREOF IN IDENTIFICATION OF HLA TYPES

(57) Abstract

The allelic type of a polymorphic genetic locus in a sample is identified by first combining the sample with a sequencing reaction mixture containing a polymerase, nucleoside feedstocks, one type of chain terminating nucleoside and a sequencing primer to form a plurality of oligonucleotide fragments of differing lengths, and then evaluating the length of the oligonucleotide fragments. As in a standard sequencing procedure, the lengths of the fragments indicate the positions of the type of base corresponding to the chain terminating nucleotide in the extended primer. Instead of perferming and evaluating four concurrent reactions, one for each type of chain terminating nucleotide, however, the sample is concurrently combined with at most three, and preferably only one, sequencing reaction mixtures containing different types of chain terminating nucleotides. The information obtained from this test is evaluated prior to performing any additional tests on the sample. In many cases, evaluation of the positions of only a single base using one sequencing reaction will allow for allelic typing of the sample.

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A. CLASS	SIFICATION OF SUBJECT MATTER C12Q1/68				
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C. DOCUM	MENTS CONSIDERED TO BE RELEVANT		· i		
Category *	<del>~~~~~~~~~~~~</del>	e rele	am passages	Relevant to claim No.	
X	WO 92 15711 A (UNIV MINNESOTA)	17		1-19	
	September 1992		7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	,	
	see claims and examples		<i>!</i> 3		
Х	EP 0 351 138 A (HARVARD COLLEGE	) 1	, ; · · · · · · · · · · · · · · · · · ·	1-15	
•	January 1990		\$ 4	·	
	see whole document esp. claims		•		
Х	PROC. NATL. ACAD. SCI.		t V	1-15	
	vol. 74, no. 12, December 1977,				
	pages 5463-5467, XP002033434 SANGER F. ET AL.,: "DNA seque	ncii	i Marith		
	chain-terminating inhibitors"	HC H	:	•	
	see the whole document			<b>\</b>	
X	DE 38 41 565 A (EUROP LAB MOLEK	ISL AT		1.2	
۸	28 June 1990	ULA	(BIULUG)	1,2	
	see the whole document				
			·	<u> </u>	
Fun	ther documents are listed to the continuation of box C.		Patent family members are listed	in annex.	
* Special ca	stegories of cated doruments;	-7-	later document published after the int	emational filing date	
	ent defining the general state of the art which is not	•	or priority date and not in conflict we cited to understand the principle or it	ith the application but	
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filing date  "L" document which may throw doubts on priority claim(s) or			cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone		
	is cited to establish the publication date of another on or other special reason (as specified)	γ.	document of particular relevance; the		
	nent referring to an oral disclosure, use, exhibition or means		document is combined with one or in ments, such combination being obvious	nore other such docu-	
	tent published prior to the international filing date but than the priority date claimed	٠.	in the art. document member of the same patent	t family	
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	20 June 1997		0 7, 07, 9	<del>1</del> 7	
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# INTERNATIONAL SEARCH REPORT

information on patent family members

Inter: nal Application No PCT/US 96/20202

*(*)

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9215711 A	A 17-09-92	US 5578443 A	26-11-96
		CA 2105585 A	07-09-92
		EP 0577708 A	12-01-94
		JP 6505391 T	23-06-94
		US 5629149 A	13-05-97
EP 0351138 A	17-01-90	US 4962020 A	09-10-90
	2, 02 50	AT 119579 T	15-03-95
		AU 614245 B	22-08-91
		AU 3798689 A	18-01-90
		CN 1039845 A	21-02-90
		DE 68921515 D	13-04-95
		DE 68921515 T	13-07-95
		JP 2154699 A	14-06-90
		LT 1515 A	26-06-95
		US 5498523 A	12-03-96
		US 5122345 A	16-06-92
		US 5409811 A	25-04-95
DE 3841565 A	28-06-90	US 5124247 A	23-06-92

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